

Information for Epigenetics - Reading information and watching videos questions - Use these links to make it easier to find!
****If the link on the handout does not work, use the following!**

Link for H. Chemistry student

<https://docs.google.com/forms/d/e/1FAIpQLSdKgpRiCdpc1yB6HzfPVauEw7DvEVnZCJ2jGVRFIvJLwGgsGg/viewform>

Questions 1- 7 - use this link! It is the video of the older twins in the red dress!

<https://video.search.yahoo.com/yhs/search?fr=yhs-itm-001&hsimp=yhs-001&hspart=itm&p=epigenetics+twins&vm=r#id=1&vid=902d1d39130d214734514c51c8545ba8&action=click>

Questions 8-10

<https://www.youtube.com/watch?v=OOiCu5kzGxg>

Questions 11-35 - but you will need to go to the correct section from the home page

<https://learn.genetics.utah.edu/>

Questions 36-40 and 42 - part 4 of a ghost in your genes

<https://www.dailymotion.com/video/xhycdx>

Question 41 - Go back to the learn genetics site - epigenetics - Insights from identical twins

Questions 43-45 - part 5 of a ghost in your genes - watch the first half

<https://video.search.yahoo.com/yhs/search?fr=yhs-itm-001&hsimp=yhs-001&hspart=itm&p=bbc+horizon+a+ghost+in+your+genes&vm=r#id=8&vid=e04186e0a1a211ba15b388dcd4f950bb&action=view>

Question 46-49 - learn genetics site

Question 50-56 - Since the bar graphs are difficult to see on your handout, Use the experiment description and the extra 3 diagrams below to answer the questions!

Extra Information

In a particularly interesting experiment, pregnant agouti mice were fed bisphenol A (BPA), a common chemical found in plastic food and beverage containers, including baby bottles. More of their offspring were obese and had yellow coats, indicating lower DNA methylation levels. In a

second experiment, supplementing the diets of pregnant agouti mice with methyl-rich foods such as folic acid or the genistein found in soy products, while also feeding them BPA, led to increased numbers of brown, slimmer mice with higher DNA methylation levels.

Experimental results

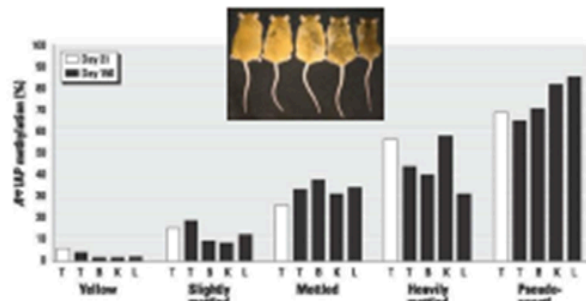


Figure 4. Average *A^y* IAP methylation as a function of coat color, tissue type, and age. Abbreviations: B, brain; K, kidney; L, liver; T, tail. Average methylation across CpG sites 1–9 in day 150 tissues derived from ectodermal (B and T), mesodermal (K), and endodermal (L) tissues from five genistein-supplemented *A^y* mice representing the five coat-color phenotypes is correlated with that in day 21 tail tissue (Pearson's $r > 0.8$ and $p < 0.05$ for each correlation).

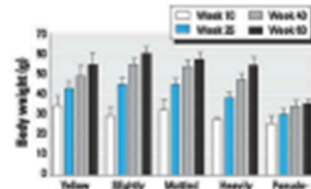
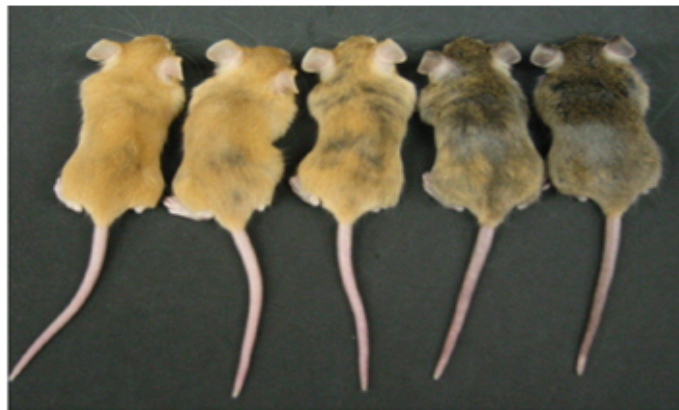
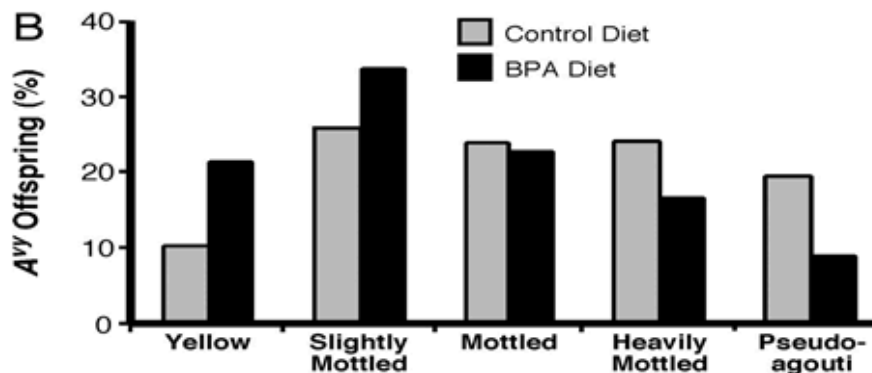


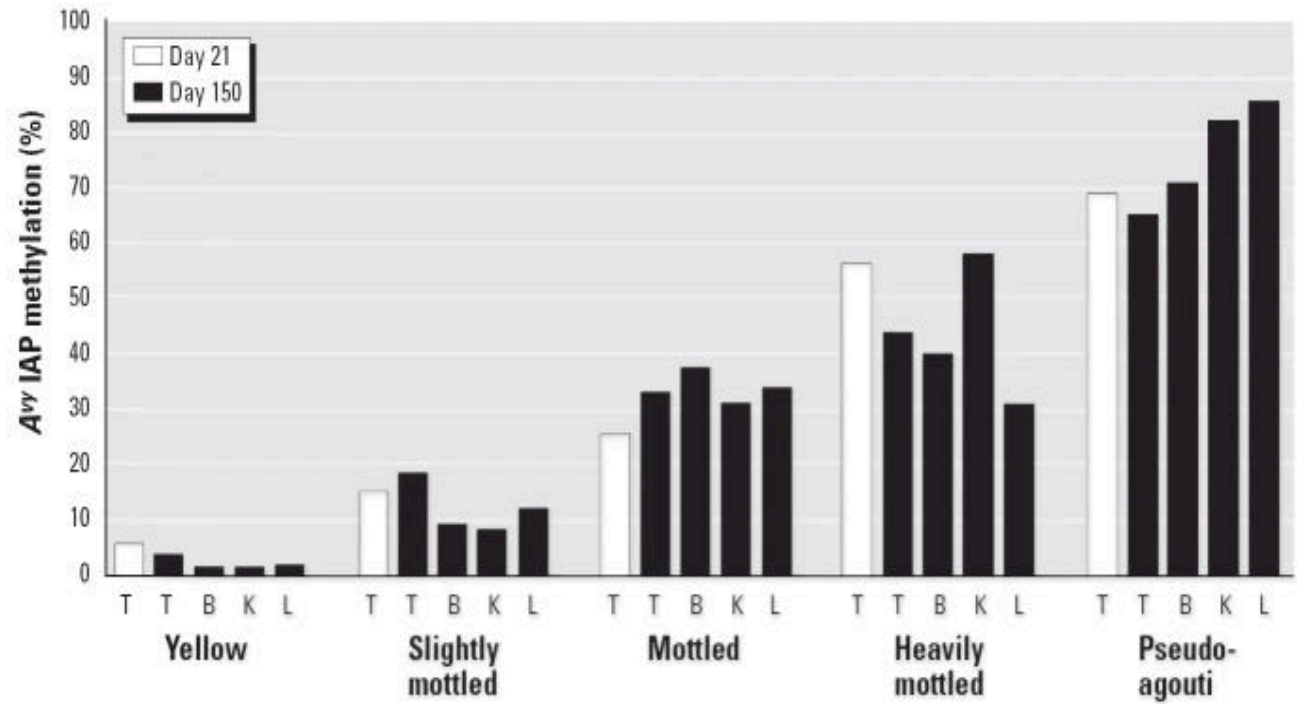
Figure 5. Variation of average body weight among animal coat-color classes over time. Significant weight differences among coat-color classes start at week 25 and continue through adulthood. Pseudoagouti animals exhibit normal body weight compared with overweight yellow, slightly mottled, mottled, and heavily mottled animals due to hypermethylation in the *A^y* IAP region, which shuts off ectopic Agouti transcription. By shifting the offspring population coat-color distribution toward brown pseudoagouti animals, genistein supplementation significantly increases the incidence of normal-body-weight animals.

A



B





The average body weight in grams of the mice at 60 weeks is

Yellow = 56g

Slightly mottled (mostly yellow but brown spots) = 60g

Mottled = 58g

Heavily mottled = 54g

Pseudo-agouti = 38g

